IN THE CLAIMS:

Please cancel claims 32-36 without prejudice:

1. (Original) A method for processing a substrate, comprising:

a. depositing a metal film on the substrate by the decomposition of a first organometallic precursor in the presence of a processing gas; then

b. depositing a metal nitride film on the metal film by the decomposition of a second organometallic precursor in the presence of a nitrating reactant gas, wherein the first and second organometallic precursors have the formula:

$(Cp(R)_n)_xMH_{y-x}$,

wherein:

Cp is a cyclopentadienyl functional group,

M is a metal selected from the group consisting of tantalum, vanadium, niobium, and hafnium,

R is an organic group,

n is an integer from 0 to 5,

x is an integer from 1 to 4, and

y is the valence of M.

2. (Original) The method of claim 1, wherein the organic group has at least one carbon-silicon bond.

3. (Original) The method of claim 2, wherein the organic group comprises an alkyl silyl group having between 0 and 3 hydrocarbyl substituents selected from the group consisting of silyl, methylsilyl, dimethylsilyl, trimethylsilyl, and combinations thereof.

4. (Original) The method of claim 1, wherein the first and second organometallic precursors are the same organometallic precursor.

5. (Original) The method of claim 1, wherein the metal nitride film is deposited at a pressure of less than about 20 Torr.

6. (Original) The method of claim 1, wherein the metal film and the metal nitride film are deposited sequentially in the same chamber.

7. (Original) The method of claim 1, wherein the metal film and the metal nitride film are deposited at a pressure of less than about 20 Torr.

8. (Original) The method of claim 1, wherein the metal film is composed of a material selected from the group consisting of vanadium, tantalum, niobium, hafnium, vanadium silicide, tantalum silicide, niobium silicide, hafnium silicide, and combinations thereof.

9. (Original) The method of claim 1, wherein the metal nitride film is composed of a material selected from the group consisting of tantalum nitride, tantalum carbon nitride, tantalum silicon nitride, vanadium nitride, vanadium carbon nitride, vanadium silicon nitride, niobium nitride, niobium carbon nitride, niobium silicon nitride, hafnium nitride, hafnium carbon nitride, hafnium silicon nitride, and combinations thereof.

10. (Original) The method of claim 1, further comprising exposing the metal film to a first plasma and exposing the metal nitride film to a second plasma.

11. (Original) A method for processing a substrate, comprising:

a. introducing a organometallic precursor into a processing chamber maintained at a pressure of less than about 20 Torr, the organometallic precursor having the formula:

$$(Cp(R)_n)_xMH_{y-x},$$

wherein:

Cp is a cyclopentadienyl functional group,

M is a metal selected from the group consisting of tantalum, vanadium, niobium, and hafnium,

R is an organic compound,

n is an integer from 0 to 5, and

x is an integer from 1 to 4, and

y is the valence of M;

b. exposing the organometallic precursor to a processing gas; and

c. decomposing the organometallic precursor to deposit a film.

12. (Original) The method of claim 11, wherein the deposited film is a material selected from the group consisting of tantalum, tantalum nitride, tantalum carbide, tantalum silicon nitride, vanadium, vanadium nitride, vanadium carbide, vanadium silicon nitride, niobium, niobium nitride, niobium carbide, niobium silicon nitride, hafnium, hafnium nitride, hafnium carbide, hafnium silicon nitride, and combinations thereof.

13. (Original) The method of claim 11, wherein the organic group has at least one carbon-silicon bond.

14. (Original) The method of claim 11, wherein the organic group comprises an alkyl silyl group is a hydrocarbon having at least one carbon-silicon bond and between 0 and 3 hydrocarbyl substituents selected from the group consisting of silyl, methylsilyl, dimethylsilyl, trimethylsilyl, and combinations thereof.

15. (Original) The method of claim 11, wherein the organometallic precursor decomposes by heating the substrate to a temperature above the decomposition temperature of the organometallic precursor.

16. (Original) The method of claim 15, wherein the temperature of the substrate is between about 100ºC and about 450ºC.

17. (Original) The method of claim 11, wherein the organometallic precursor decomposes by generating a plasma at a power of between about 200 watts and about 1000 Watts.

18. (Original) The method of claim 11, further comprising:

d. exposing the film to a plasma.

19. (Original) The method of claim 18, wherein the film comprises tantalum, the processing gas is selected from the group consisting of argon, hydrogen, and combinations thereof, and the plasma comprises a gas selected from the group consisting of argon, hydrogen, and combinations thereof.

20. (Original) The method of claim 18 wherein the film comprises tantalum, the processing gas comprises argon, and the plasma comprises argon.

21. (Original) A method for forming a feature on a substrate comprising:

depositing a dielectric layer on the substrate;

etching an aperture within the dielectric layer;

depositing a metal layer conformally on the dielectric layer by decomposing a first organometallic precursor in the presence of a processing gas;

depositing a metal nitride layer conformally on the metal layer by decomposing a second organometallic precursor in the presence of a nitrating reactant gas at a pressure of less than about 20 Torr,

wherein the first and second organometallic precursors have the formula:

$(Cp(R)_n)_xMH_{y-x}$,

wherein:

Cp is a cyclopentadienyl functional group,

M is a metal selected from the group consisting of tantalum, vanadium, niobium, and hafnium,

R is an organic group,

n is an integer from 0 to 5,

x is an integer from 1 to 4, and

y is the valence of M; and

depositing a conductive metal layer on the metal nitride layer.

22. (Original) The method of claim 21, wherein the organic group has at least one carbon-silicon bond.

23. (Original) The method of claim 21, wherein the organic group comprises an alkyl silyl group having between 0 and 3 hydrocarbyl substituents selected from the group consisting of silyl, methylsilyl, dimethylsilyl, trimethylsilyl, and combinations thereof.

24. (Original) The method of claim 21, wherein the first and second organometallic precursors are the same organometallic precursor.

25. (Original) The method of claim 21, wherein the metal film and the metal nitride film are deposited sequentially in the same chamber.

26. (Original) The method of claim 21, wherein the metal film is composed of a material selected from the group consisting of vanadium, tantalum, niobium, hafnium, vanadium, tantalum, niobium, hafnium, vanadium silicide, tantalum silicide, niobium silicide, hafnium silicide, and combinations thereof, and combinations thereof.

27. (Original) The method of claim 21, wherein the metal nitride film is composed of a material selected from the group consisting of tantalum nitride, tantalum carbon nitride, tantalum silicon nitride, vanadium nitride, vanadium carbon nitride, vanadium silicon nitride, niobium nitride, niobium carbon nitride, niobium silicon nitride, hafnium nitride, hafnium carbon nitride, hafnium silicon nitride, and combinations thereof.

28. (Original) The method of claim 21, further comprising exposing the metal film to a first plasma, the first plasma comprises gases selected from the group consisting of argon, hydrogen, and combinations thereof.

29. (Original) The method of claim 21, further comprising exposing the metal nitride film to a second plasma, the second plasma comprises gases selected from the group consisting of argon, hydrogen, nitrogen, ammonia, and combinations thereof.

30. (Original) The method of claim 21, wherein the conducting metal layer is copper.

31. (Original) The method of claim 21, wherein the conducting metal layer is deposited by electroplating.

32-36. (Cancelled)